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Cook County
Chicago Heights / Hall Aluminum

CLEA CHARLES LICHT ENGINEERING ASSOCIATES, INC.

POST OFFICE BOX 315, OLYMPIA FIELDS, ILLINOIS 60461, U.S.A. 312/748-9017
312/721-7882

February 4, 1985

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FEB 04 1985
ILL. E.P.A. - D.L.P.C.
STATE OF ILLINOIS

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FEB 26 1985
IEPA-DLPC

Mr. Major Hearn
Illinois EPA
1701 S. First Avenue
Maywood, IL 60153

Subject: Hall Aluminum Co.

Dear Mr. Hearn:

Based on the request made by the Agency, the Hall Aluminum Co. has carried out a sampling and testing program based on the fact that the Agency reported high lead in a grab sample of their dross that was made during a visit to the plant some months ago.

The sampling was done on January 18, 1985, in accordance with the USEPA's SW-846 document and included the establishment of the grid, the obtaining of random numbers from a computer to establish the location of the grid sampling points, and then bringing a backhoe into the plant site to dig down approximately the full depth of the areas indicated so as to obtain samples from top to bottom.

Initially we had expected that the sampling would be done by core drilling, however, ATEC Associates in Merrillville, Indiana, who were called on both to establish the locations based on the grid determined by us and to do the sampling, found that they could not get their drill equipment onto the piles. Because of this, we used their services to locate the sampling points and then brought in a local construction company backhoe to do the digging. The Gulf Coast Laboratories provided a two man crew who sampled the materials that were taken from these holes as they were taken. The sampling procedure was witnessed by the undersigned and by Ms. Bonnie Eleder of your office.

The samples were properly mixed in the field and were then quartered down so that approximately a one pint size sample at each point was obtained.

Eleven points were samples on a random basis and did cover essentially the entire mass area of the materials.

We requested that Gulf Coast Laboratories analyze for lead only six of the eleven samples that were obtained. The results of these six samples are reported on the attached report from Gulf Coast Laboratories.

Sampling was done based on SW-846, Section 1.1.3 requirements.

Taking the six results and doing the calculations indicated in Section 1.1.1 for the statistical analysis of the sampling results, we submit the attached calculations.

The formulas are found in Section 1, pages 2 and 3 for Table 1 and Section 1, page 4 for Table 2.

The reported samples which represent i = 1 to i = 6 are:

2.6, 0.4, 0.5, 1.2, 1.8, 1.3.

The mean is 1.3 ppm.

The variance is 0.68.

The standard deviation is 0.825.

The standard error is 0.337.

The confidence interval, which we calculated only on the plus side, is 1.797.

Since the regulatory threshold is 5 for lead and the confidence interval result is 1.797, we have sufficient information to indicate that the pile is not hazardous.

We did run one additional calculation to see whether there was any need for resampling using the last formula in Table 1, which indicated that the number of additional samples that would be necessary to be obtained was less than 1 and, therefore, no additional sampling was called for.

On a basis of these samples obtained properly in accordance with the Federal test methods procedures, the results obtained from Gulf Coast Laboratories on these samples, and the calculations which are attached hereto, it appears that there is no reasonable basis for considering the slag pile to be hazardous. We would, therefore, request that your file in this matter be closed.

Very truly yours,

CHARLES A. LICHT, P.E.
President

CAL/ba
enclosures - Lab results, Calculations, Plat Layout Grid

cc: Ms. Bonnie Eleder, Illinois EPA, Maywood
Mr. Don Retsky, Hall Aluminum Co.
Mr. Bill Peters, Hall Aluminum Co.

1 $$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$ n = no. of samples $= 6$

$$= \frac{2.6 + 0.4 + 0.5 + 1.2 + 1.8 + 1.3}{6} = 1.3$$

2 $$s^2 = \frac{\sum_{i=1}^{n} x_i^2 - \frac{\left(\sum_{i=1}^{n} x_i\right)^2}{n}}{n-1}$$

$$\Sigma x_i^2 = 6.76 + 0.16 + 0.25 + 1.44 + 3.24 + 1.69 = 13.54$$

$$\Sigma x_i = n(\bar{x}) = 7.8$$

$$\frac{(\Sigma x_i)^2}{n} = \frac{7.8^2}{6} = 10.14$$

$$s^2 = \frac{13.54 - 10.14}{5} = 0.68$$

3. $$s = \sqrt{s^2} = 0.825$$

4. $$s_{\bar{x}} = \frac{s}{\sqrt{n}} = \frac{0.825}{\sqrt{6}} = 0.337$$

5. $$CI = \bar{x} \pm t_{.20}(s_{\bar{x}})$$

FROM TABLE 2 with degree of freedom of $n-1 = 5$

$$= 1.3 \pm 1.476(0.337) = 1.797$$

6. Check for resample:

$$n = \frac{\left[t_{.20}\right]^2 \left[s\right]^2}{\Delta^2}$$

$$\Delta = RT - \bar{x} = 5 - 1.3 = 3.7$$

$$n = \frac{[1.476]^2 \cdot [0.68]}{3.7} = \frac{1.496}{3.7} = 0.4$$

NO NEED FOR ADDITIONAL SAMPLING

HALL ALUMINUM COMPANY

Smelters and Manufacturers of Specification Alloys

ILD005246590
0310450024

1751 STATE STREET
CHICAGO HEIGHTS, ILLINOIS 60411
P.O. BOX 223 AC 312 757-7350

July 10, 1985

CERTIFIED MAIL
P 016 589 403

Mr. Major Hearn, P. E.
Illinois EPA
1701 S. First Avenue, Suite 600
Maywood, IL 60153

Re: Notification of Hazardous Activity
Withdrawal Request ILD 005246590

Dear Mr. Hearn:

Enclosed is a copy of our certification letter in the matter of our "Notification of Hazardous Waste Activity" withdrawal.

I believe the matters are self-explanatory, but if questions arise, contact the undersigned or Charles A. Licht, P. E. (312-755-0075).

Very truly yours,

HALL ALUMINUM COMPANY

Donald Retsky, President

DRp:bl

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JUL 25 1985
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cc: Charles A. Licht, P.E.

enc.

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JUL 12 1985
ILL. E.P.A. – D.L.P.C.
STATE OF ILLINOIS

CC: DIVISION FILE

RECEIVED
JUL 25 1985
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HALL ALUMINUM CO.

BACKGROUND

The secondary aluminum industry has existed for over 80 years. The primary purpose of the industry is to reclaim aluminum scrap materials placing them into appropriate alloy configurations by process of mixing, blending and refining, so that these materials can be reused.

A very vital part of the aluminum economy depends on the recycling of aluminum since the scrap is a much lower cost raw material than is the new aluminum.

Our company purchases the scrap from a variety of sources. Some of the scrap is obtained from industrial sources where the scrap is manufactured as a by-product of their operation. We also obtain material from scrap dealers and metal brokers which is generated in the same manner. Additionally, we purchase materials from scrap dealers and brokers who in turn obtain the scrap from a variety of obsolete sources. These may be materials such as transportation components (bus bodies, paneling from trucks, etc.) or housing components such as siding, gutters, downspouts. It can be automotive components such as transmission housing, pistons, etc. When the scrap is received by us it is verified as to its general alloy configuration and then appropriately processed. (See Figure 5)

SCRAP PROCESSING

1. Materials which we receive which are oversize and contain various contaminations are run through our hammer mill shredding unit where the nonmetallics are generally broken free from the metallic components and irony components are separated by magnets from the aluminum components. By processing these materials we are able to remove free iron which is sold to the scrap yard and to remove other materials such as fiberglass insulation and other nonmetallic components. This debris is disposed of to landfill. (See Figures 1 & 6)

2. In the case of manufactured scrap such as aluminum chips and turnings, if the materials have moisture on them they are run through our crushing and drying procedure which allows us to remove the oil and moisture (used as lubricants in the cutting processes). After crushing and drying we magnet the materials to remove free iron. This process is controlled by a means of an afterburner which consumes any of the smokey fumes generated in the drying unit. The by-products of this operation, the irony fines with aluminum content, are shipped to a variety of processors who use them as substitute raw materials for the manufacture of hot topping compounds and other materials. (See Figure 2 and Figure 6)

3. Other materials which are clean and adequately sized are charged to the melting furnaces directly. (See Figure 6 and 7)

SCRAP MELTING

1. Various scraps after being charged to the melting furnace with proper blending will then have added to it a variety of additional alloying elements such as silicon and copper. (See Figure 3 and 7)

2. The melting process also involves the use of a smelter's flux which is basically a mixture of sodium chloride, potassium chloride, and a very small percentage of potassium aluminum fluoride. (See Figure 7)

3. The skimmings from the furnace, which are made up of aluminum oxide from the metal plus the fluxes, are skimmed and cooled and then shipped to processors who reclaim the metal content. The materials from the air pollution control system, i.e., the baghouse fines, contain sufficient amounts of aluminum content to allow these to be mixed with the slag and shipped to the recycler. (See Figure 7)

4. Magnesium is removed by the use of a fluxing procedure wherein the company uses chlorine in a special chlorination compartment of the furnace to reduce the magnesium, forming magnesium chloride.

The magnesium removal process involves the introduction of chlorine into the molten aluminum bath. Most of the residue of this process is magnesium chloride which is skimmed with the other chloride skimmings and shipped to reclaimers for metal reclamation. A very small percentage of the chlorine reacts with the aluminum to form aluminum chloride.

5. The aluminum chloride is scrubbed in a chlorination bell system. The flows from this system are piped into an elementary neutralization system wherein lime is used to neutralize the acidity of the flow. The neutralized solution is then run to a lagoon on the property. This lagoon has been checked from time to time and does not show any excessive levels of either acid or alkalinity. The metal values in the lagoon appear to be quite low. (See Figures 4 and 7)

ON SITE DISPOSAL

Some years ago the previous owner of the company had accumulated large volumes of aluminum skimmings and slags with the purpose of reclaiming these materials, however, these materials were not reclaimed and have remained on site. During a visit to the plant site during the summer of 1984, a random grab sample was taken by an Illinois EPA person. The sample was found to contain more than 5 parts per million of lead by EP Toxicity. We are unable to account for this eccentricity. During the winter of 1984/85 a very complete testing program was initiated predicated on USEPA regulations. The sampling was done throughout the mass of this residual material. The test was witnessed by Illinois EPA personnel and was carried out under the supervision of our consulting engineer, Charles A. Licht, who, working in conjunction with Gulf Coast Laboratories of University Park, Illinois, developed the appropriate procedures and witnessed the taking of the samples by the Gulf Coast personnel. The test results from this were reported to the Illinois EPA and to USEPA. It was shown that the materials that were stored were not hazardous by any criteria.

The processes described above are shown in the attached figures.

PREPARED BY

Charles A. Licht, P.E.

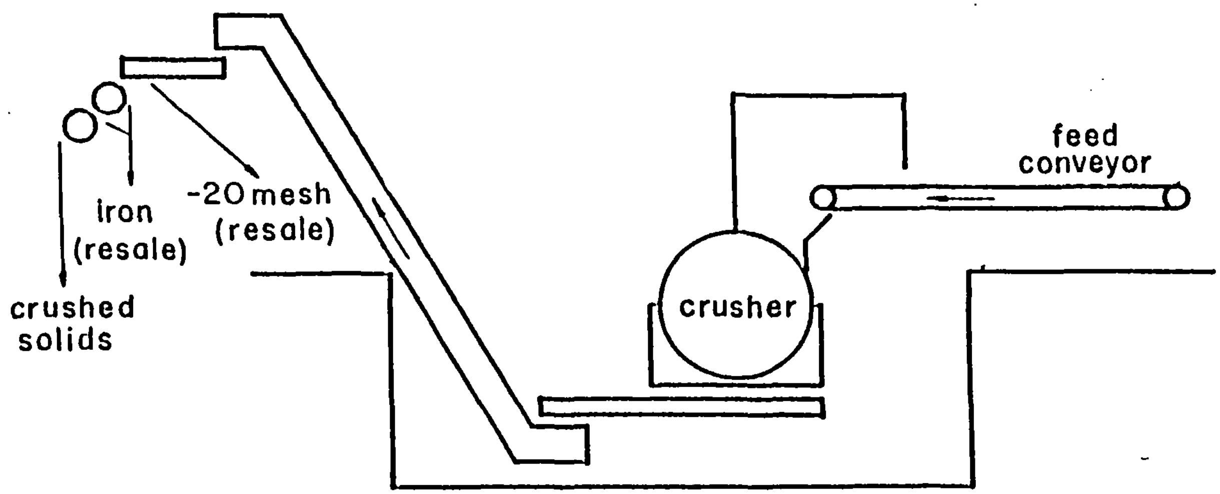

Figure 1 - ALUMINUM SCRAP PROCESSING

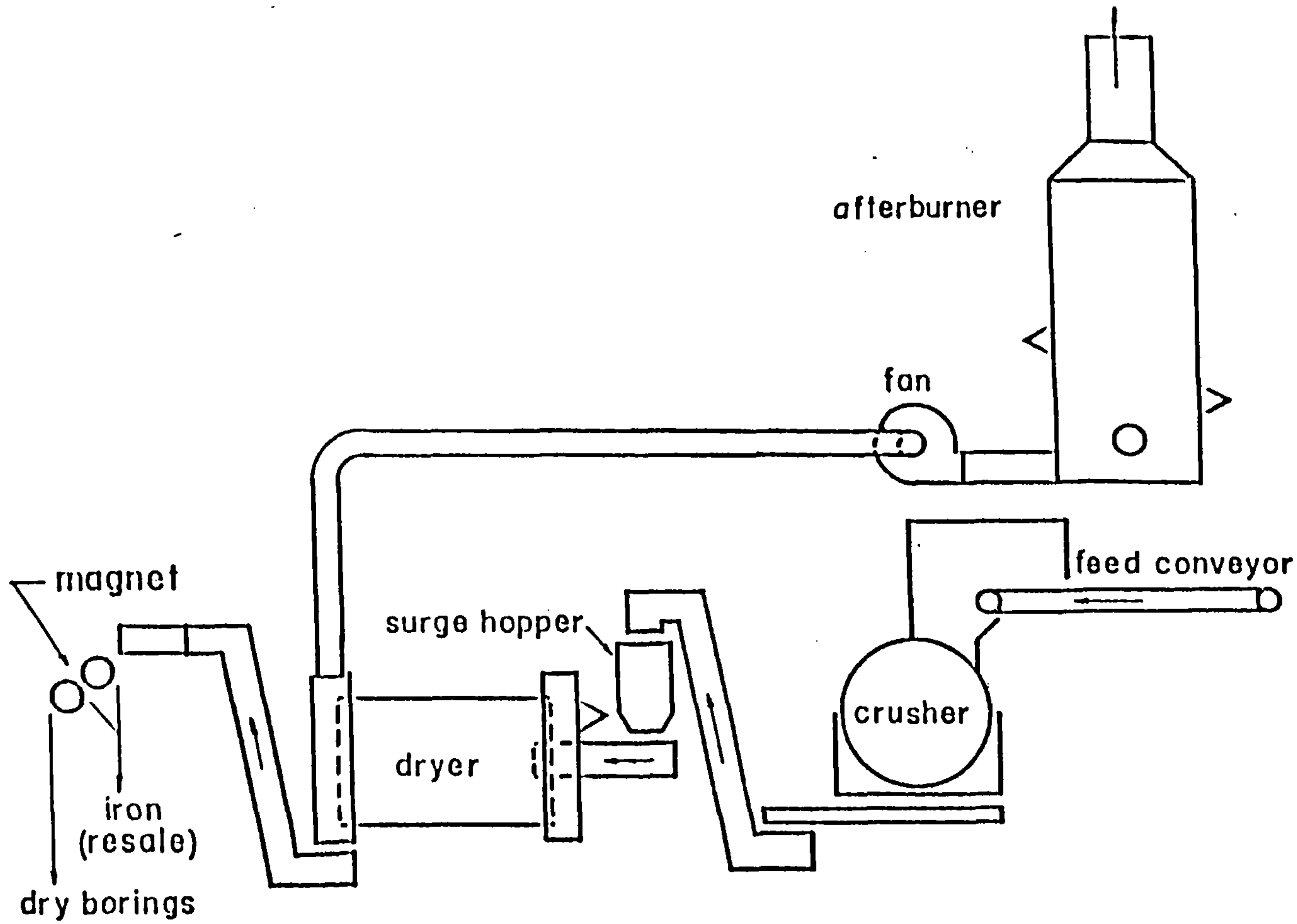

Figure 2 - ALUMINUM BORINGS PROCESSING

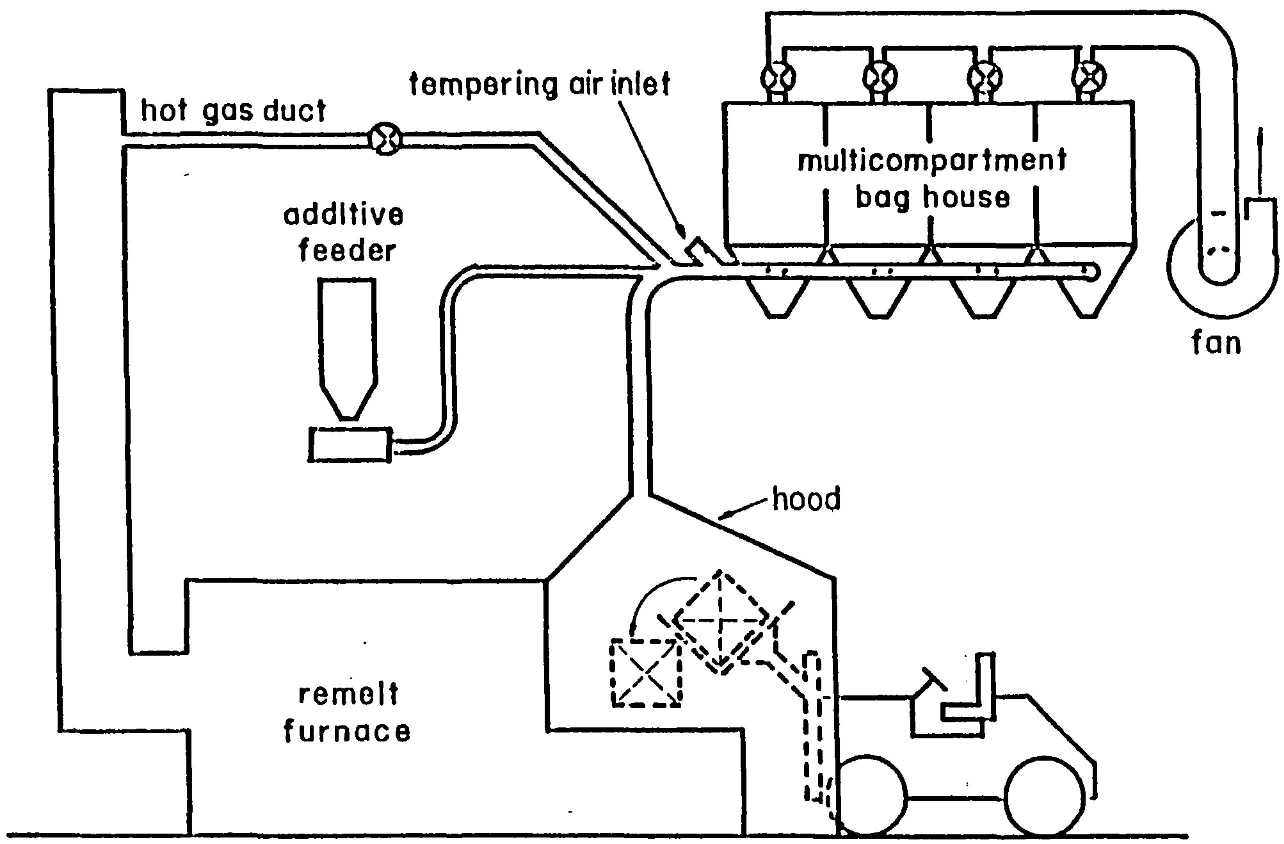

Figure 3 - MELTING

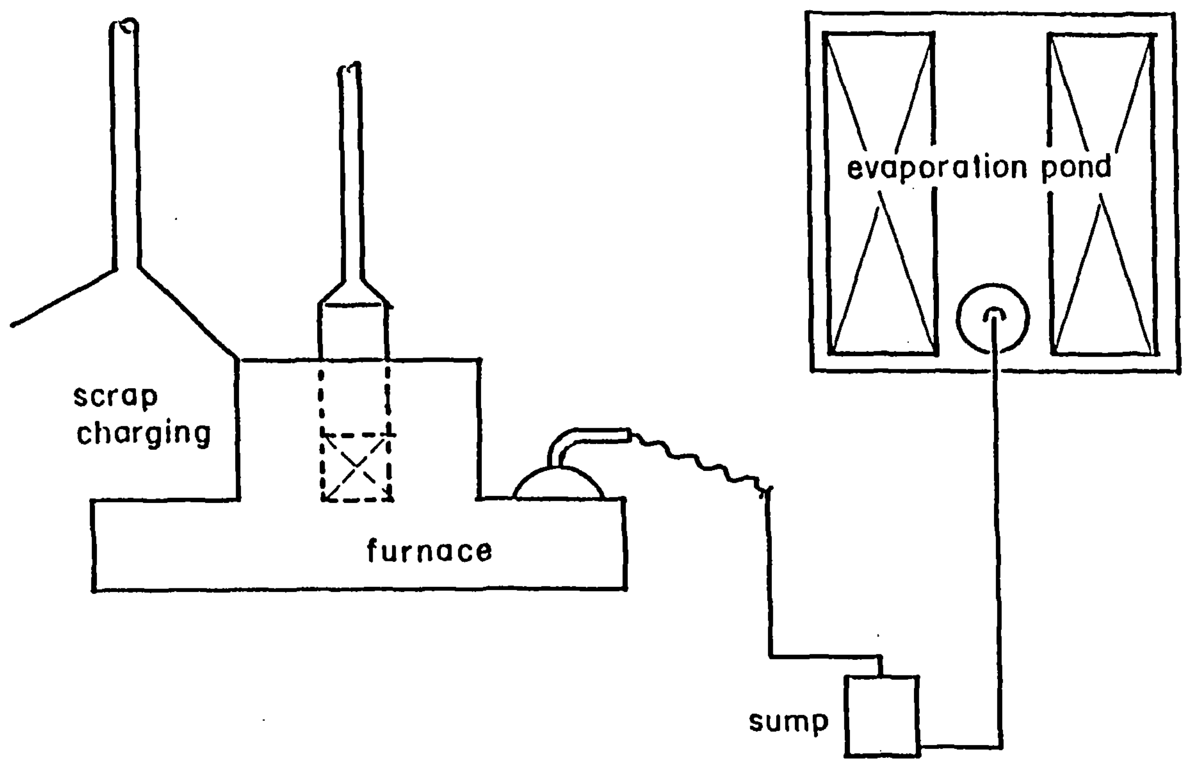

Figure 4 - MAGNESIUM REMOVAL

RAW MATERIAL FLOW

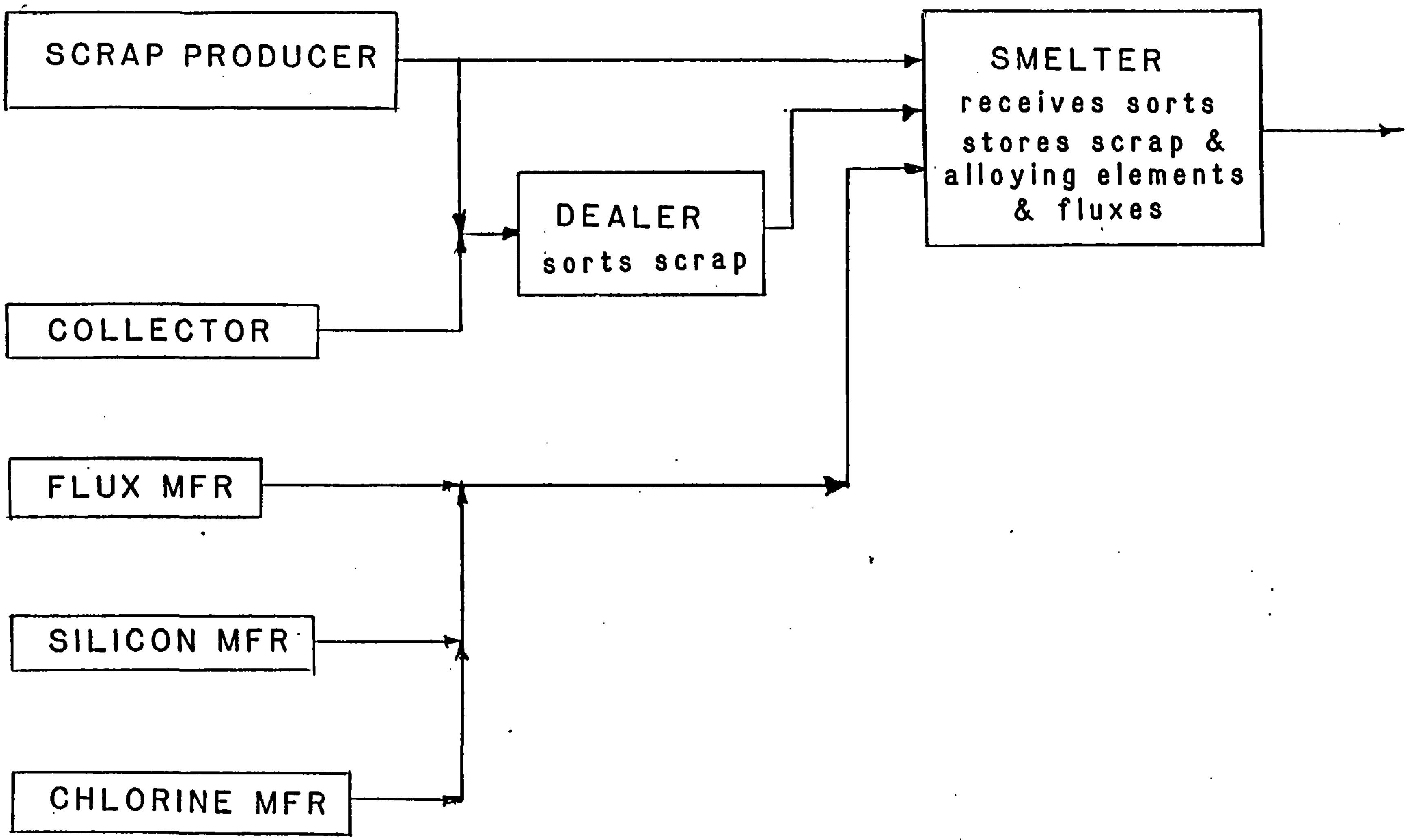

FIGURE 5

SCRAP PREPARATION

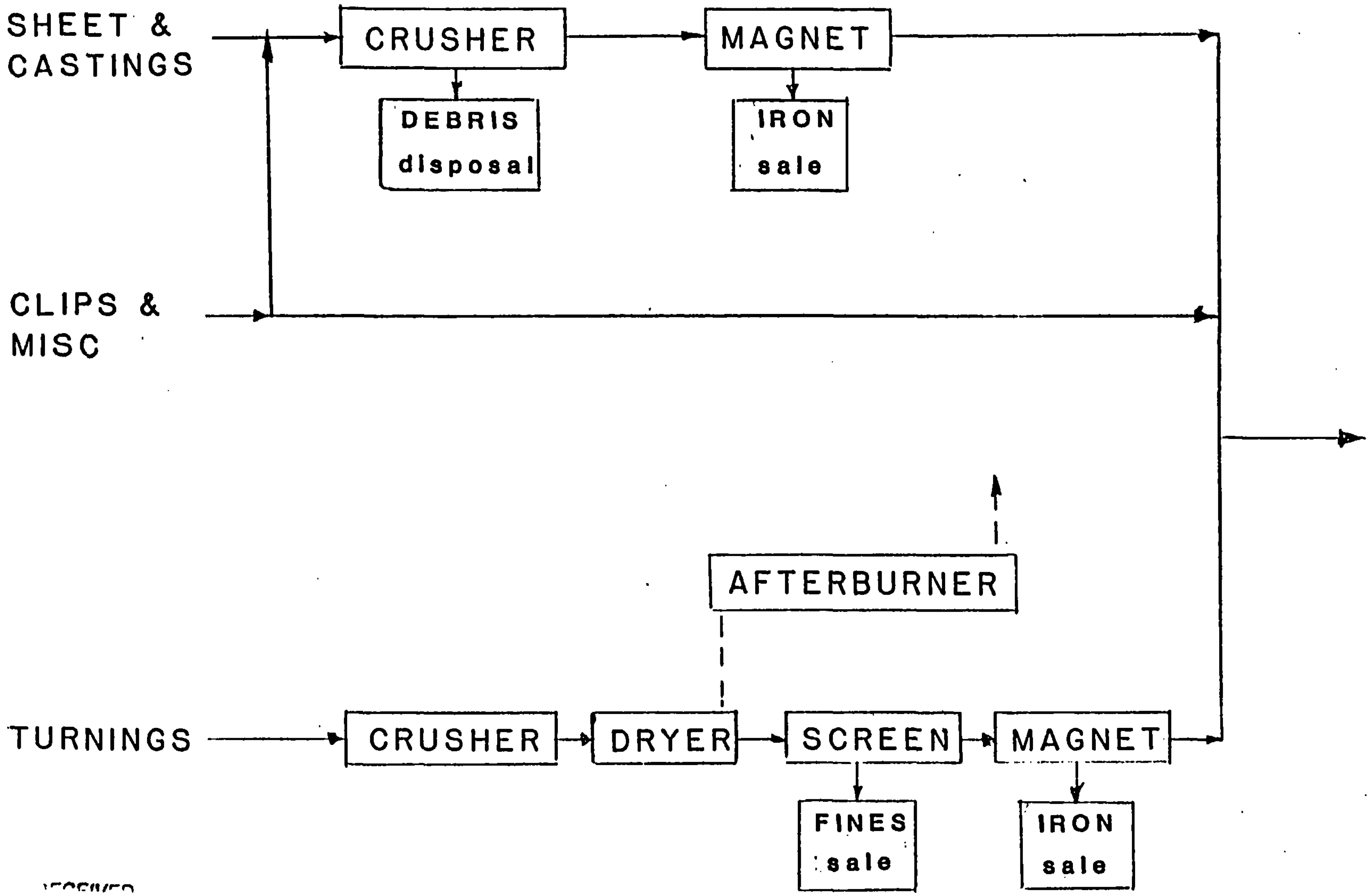

FIGURE 6

MELTING & REFINING PROCESS

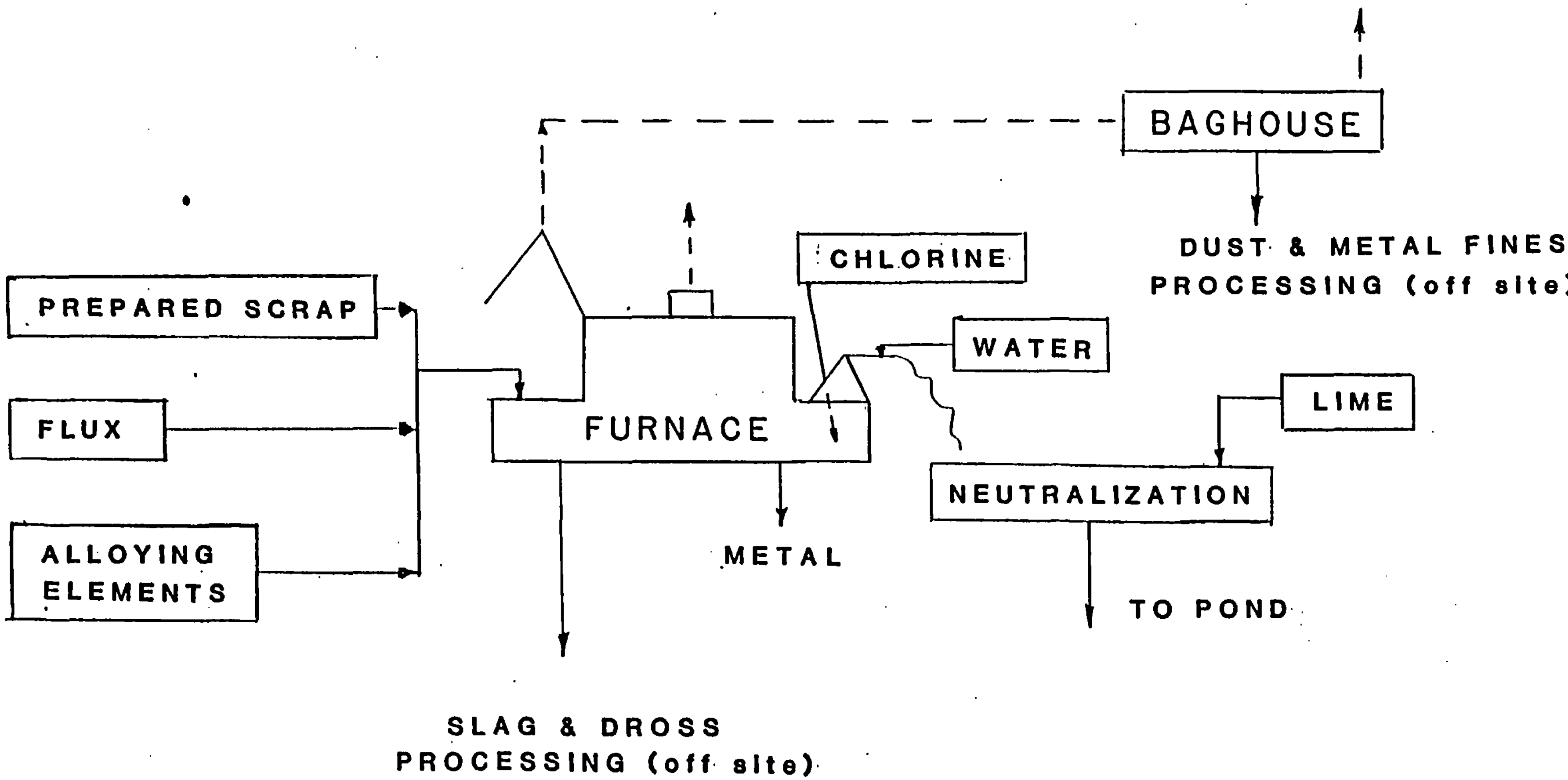

FIGURE 7